



**Fig. S3 Computation of the maps of  $\text{Ca}^{2+}$  activity.** (A) Cumulative distribution of fluorescence fluctuations of two pixels compared to Gaussian cumulative distribution (black curve). The green pixel is representative of areas with fluorescence fluctuations depending only on noise (*i.e.* border of the fish) and its distribution is normal (dashed green). The orange pixel in the cerebellum has a skewed distribution because of the positive  $\text{Ca}^{2+}$  transients (orange). The more active is a pixel, the larger is difference between its cumulative distribution and the Gaussian cumulative distribution. (B) Example of a map for each model, where each pixel is color coded depending on the difference between its cumulative distribution and the Gaussian cumulative distribution. Cumulative distributions have been normalized to mean 0 and standard deviation 1.